180. Proposed by the late JOSIAH H. DRUMMOND.

If r/s is such a value of p as makes $m/(p^2-2)$ integral, prove that $(3r+4s)/(2r+3s)$ is another such value, so that an indefinite number of integral values may be obtained.

Also, if r/s is such a value of p as makes $2m/(p^2-2)$ integral, prove that $2(r+s)/(r+2s)$ is also such a value.

GEOMETRY.

201. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

Two plane sections of a right circular cone have their major axes AA', aa' coplaner, and Aa on one generator equal to $A'a'$ on the other. The projections of the sections on any plane perpendicular to the axis are confocal.

202. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

The equations $\sqrt{(l\alpha)}+\sqrt{(m\beta)}+\sqrt{(n\gamma)}=0$ and $l\beta\gamma+m\alpha\gamma+n\alpha\beta=0$ represent ellipses. If a, b, c are the sides of the triangle of reference, transform to Cartesian coördinates and find area of each ellipse.

CALCULUS.

166. Proposed by T. N. HAUN, Mohawk, Tenn.

Find the volume of the solid formed by the revolution of the curve $(y^2+x^2)=a^2(x^2-y^2)$ round the axis of x.

167. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

Integrate, $\int_0^a \int_0^b \int_0^c \frac{zdxdydz}{(x^2+y^2+z^2)^{\frac{1}{2}}}$.

MECHANICS.

157. Proposed by T. W. WRIGHT, Schenectady, N. Y.

Explain why a waterfall h feet high can support a column of water $2h$ feet high.

158. Proposed by G. H. HARVILL, A. M., Malakoff, Texas.

Show that a law of density for points in space may be assumed such that the joint mass of any two points which are electrical images of each other in respect to a given sphere may be constant, and that their centers of gravity shall lie on the surface of the sphere.

AVERAGE AND PROBABILITY.

143. Proposed by L. C. WALKER, A. M., Graduate Student, Leland Stanford Jr. University, Cal.

The extremities of two equal lines drawn from a fixed point in the circumference of a given circle is joined. Find the average area of the circle inscribed in the triangle formed.